trapped and released (including an unknown number of recaptures) were: 211 *Peromyscus leucopus*, 94 *Blarina brevicauda*, 4 *Tamias striatus*, 4 *Microtus pinetorum*, 1 *Mus musculus*, 1 *Glaucomys volans*, and 9 *Napeozapus insignis*.

Area 1 had two trapping sites, designated A and B, which were about one-fourth mile apart. Site A was near water, either adjacent to the pond or the creek draining it. The most common plants in the location were scarlet oak (*Quercus coccinea*), northern red oak (*Q. borealis*), and tulip poplar (*Liriodendron tulipifera*). Other plants included sugar maple (*Acer saccharum*), flowering dogwood (*Cornus florida*), wild cherry (*Prunus* sp.), hemlock (*Tsuga canadensis*), rhododendron (*Rhododentron* sp.), greenbrier (*Smilax* sp.), and mountain laurel (*Kalmia* sp.). Site B was within 50 yards of Highway #460, with the trapline running parallel to it. The site was generally dry and not within 100 yards of permanent water. Common plant species were scarlet oak, northern red oak, chestnut oak (*Q. prinus*), white oak (*Q. alba*), flowering dogwood, sugar maple, scattered greenbrier, and mountain laurel, with a ground cover of teaberry (*Gaultheria procumbens*). Nests in these two sites were from 3 to 15 feet above the ground. The lowest nests were in rhododendron with no adjacent greenbrier. The highest nest was in an oak tree with greenbrier close to the nest. The total number of nests at these two sites was 40, of which 14 were definitely being used, 12 were in good repair, and 14 were in poor repair.

Two additional areas, designated area 2 and area 3, were located 30 November 1968. Area 2 was 3.9 miles west of Blacksburg off County Road #655 at an altitude of 1900′. Area 3 was 1 mile farther off the same road. The dominant trees of Area 2 were Virginia pine and black locust (*Robinia pseudoacacia*). There was also an abundance of honeysuckle (*Lonicera japonica*) and greenbrier. The dominant tree in Area 3 was sugar maple and there were also scattered Virginia pine, Eastern red cedar (*Juniperus virginiana*), black locust, hawthorne (*Crataegus* sp.) and wild cherry. A heavy undergrowth of honeysuckle and greenbrier was also present. Seven nests were found in Area 2 and four in Area 3. One nest was occupied by five mice. Five golden mice were captured by hand in these areas.

Handley (1948) considered the golden mouse relatively abundant in the Piedmont and Coastal Plain but scarce in the mountains. Linzey (1966) concluded that the local occurrence of golden mice was directly related to the progress of secondary succession. The golden mouse appears to be locally abundant in second-growth areas in the mountains of southwestern Virginia. Golden mice are most easily located in the late fall and winter. Collecting by hand in these seasons would require fewer man-hours of work than trapping. However, the best bait was sunflower seeds.

We are indebted to H. S. Adams for aid in the identification of plants.

LITERATURE CITED

HANDLEY, C. O. JR. 1948. Habitat of the golden mouse in Virginia. *J. Mammal.*, 29:298-299.

HOWELL, A. H. 1939. Description of a new species of the golden mouse. *J. Mammal.*, 20:498.

LINZEY, D. W. 1966. The life history, ecology, and behavior of the golden mouse, *Ochrotomys n. nuttalli*, in the Great Smoky Mountain National Park. Ph.D. Thesis, Cornell Univ. 170 pp.

TERRES, J. K. 1966. Search for the golden mouse. *Audubon Mag.*, March–Apr.:96-101.

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A Device for Releasing Feed at Scheduled Intervals[1]

Fish and shellfish are often held experimentally in cages as indicators of environmental conditions or are raised in cages for other purposes. Sometimes the experimental site is remotely located and difficult to visit. This may prevent adequate feeding and result in a reduction in the value of the test.

A simple means of automatically maintaining feeding schedules of caged animals was developed for penaeid shrimp. This was done by placing sealed polyethylene bags of food in submerged cages in conjunction with devices that open the bags at predetermined times. The device, with feeding bag attached, is illustrated in Fig. 1. The long wooden frame holds a 50-ml flask of pitch at one end. All but about an inch of a nail is imbedded, head first, into the pitch. The exposed end of the nail is bent hook-shaped (before imbedding) and attached to one end of a piece of surgical tubing. The other end of the tube is stretched and attached to a hook secured to the end of the frame opposite the flask. By varying the pull on the nail or the viscosity of the pitch (or both) the time required to pull the nail from the pitch can be varied. Once the nail has been pulled loose the bag of food which is attached to the nail and also to the frame is ripped open and the food is release into the cage. To conserve space, several releasing devices and bags of food can be secured to one frame.

[1] Contribution No. 331 from the National Marine Fisheries Service Biological Laboratory, Galveston, Texas 77550

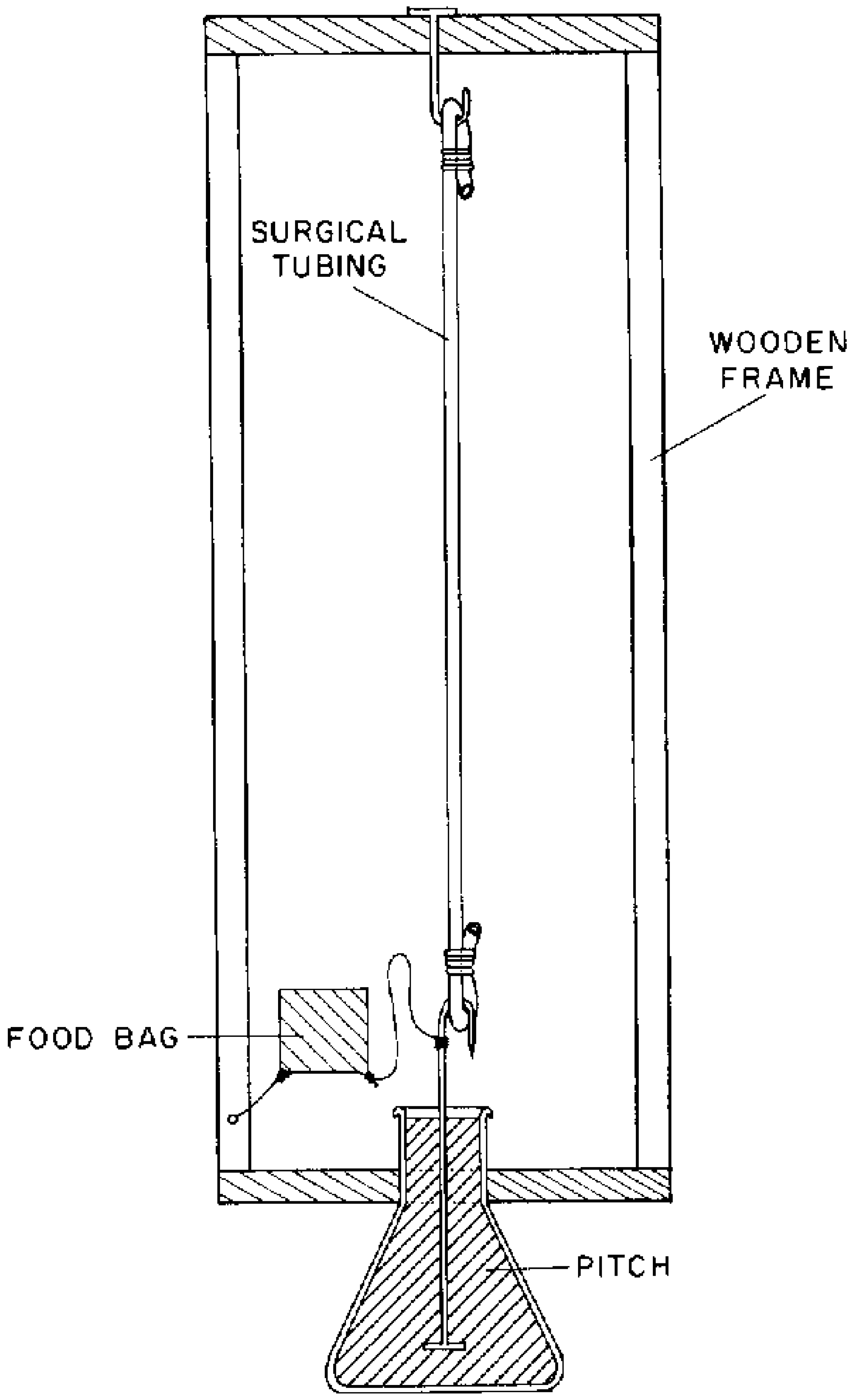

Fig. 1. Release device set and ready to be placed inside of cage.

We used a refined optical polishing pitch (Burgandy-medium grade), tubing with .635-cm bore and .30-cm wall, and 10-penny ungalvanized nails for all our release devices. The viscosity of the burgandy pitch can be increased by adding wood rosin or decreased by adding beeswax. We used a single viscosity pitch consisting of 77% pitch and 23% rosin and calibrated each device by varying the pull on the nail. The results of a calibration test based on duplicate tests are shown in Fig. 2.

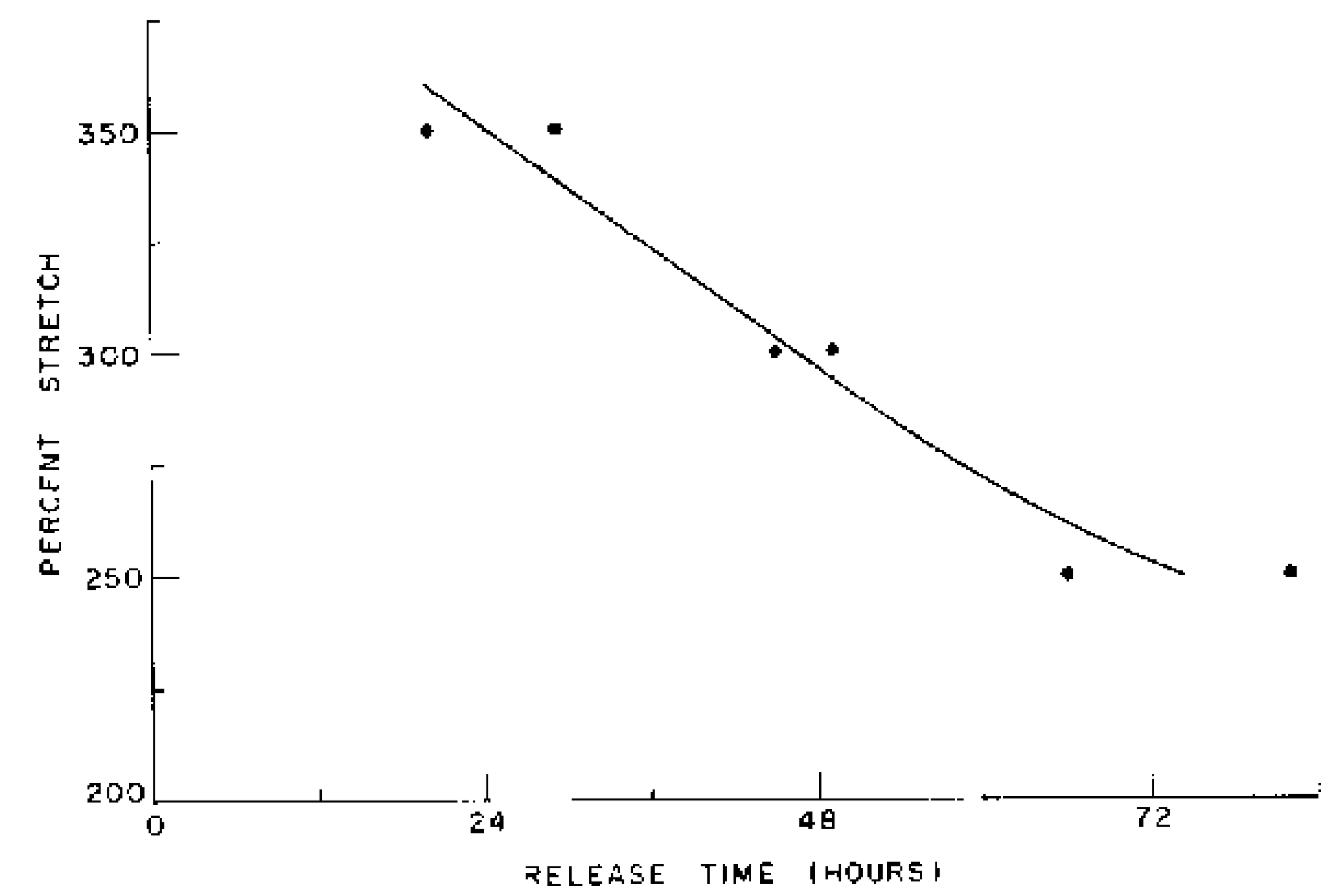

Fig. 2. Calibration test results of three sets of release devices (temperature variation during the test was 28 to 31 C).

The viscosity of the pitch varies with temperature. Therefore the temperature of the test environment must not vary more than a few degrees if close scheduling is to be maintained. The temperature during calibration should duplicate that of the environment under investigation.

Using the device illustrated, we have maintained feeding schedules at intervals of 2 days for caged shrimp placed 12 m below the sea surface in the Gulf of Mexico 13 km offshore. The cages were visited and new devices installed each week.

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Energy Requirements and Food Supplies of Ctenophores and Jellyfish in the Patuxent River Estuary

ABSTRACT: Interpretation of published data for the Patuxent River, Maryland, indicates that for most of the year the total biomass of phytoplankton and zooplankton was inadequate to meet the minimum energy needs of ctenophores and jellyfish.

Introduction

Several authors have hypothesized that ctenophores and jellyfish may exert heavy predation pressure on zooplankton. From work on the Atlantic coast of the United States alone, Nelson (1925), Bigelow and Sears (1939), Barlow (1955), Cronin, Daiber and Hulburt (1962), Burrell (1968), and Herman, Mihursky and McErlean (1968) have noted that an increase in tentaculate ctenophores (and in some cases scyphomedusae) was accompanied by a decrease in copepods. We explored the problem of ctenophore and jellyfish predation in a Chesapeake Bay tributary by comparing the plankton available in the estuary to the minimum food requirements of ctenophores and jellyfish.

Data for the comparison were drawn chiefly from two sources. Values for biomass of ctenophores and jellyfish, of other zooplankton, and of phytoplankton in the Patuxent River, Maryland were taken from Herman *et al.* (1968). In 19 samplings between October 1963 and February 1965 (Table 1) they measured total displacement volumes of ctenophores